

25 This listing of claims will replace all prior versions, and listings, of claims in the application
1 Claims 1-20 (canceled)

1 Claim 21 (original): A communications system, comprising:
2 a first base station, the first base station including:
3 i) a base station clock,
4 ii) a receiver circuit for receiving symbols coupled to
5 said clock, the receiver circuit having fixed symbol
6 timing; and
7 iii) a transmitter circuit for transmitting symbols
8 coupled to said clock, the transmitter circuit having
9 fixed symbol timing; and
10 a first mobile communications device for receiving
11 symbols broadcast by said first base station and transmitting
12 symbols to said first base station, the mobile communication device
13 including:
14 i) a receiver circuit for receiving signals from said
15 first base station, the receiver circuit including
16 receiver symbol timing adjustment circuitry for adjusting
17 receiver symbol timing as a function of a signal received
18 from said first base station; and
19 ii) a transmitter circuit for transmitting symbols
20 to said first base station, the transmitter circuit
21 including transmitter symbol timing control circuitry
22 slaved to said receiver symbol timing adjustment
23 circuitry, the transmitter symbol timing control
24 circuitry making adjustments to the transmitter symbol
25 timing which are the same or substantially the same as
26 the adjustments made by the receiver symbol timing
27 adjustment circuitry to the receiver symbol timing.

1 Claim 22 (original): The system of claim 21, wherein the signal
2 received from said first base station is a timing control signal

3 used to control the receiver circuit to make a symbol timing
4 correction.

1 Claim 23 (original): The communication system of claim 21, further
2 comprising:

3 a second mobile communications device for receiving
4 symbols broadcast by said first base station and transmitting
5 symbols to said first base station, the mobile communication device
6 including:

7 i) a receiver circuit for receiving signals from said
8 first base station, the receiver circuit including
9 receiver symbol timing adjustment circuitry for adjusting
10 receiver symbol timing as a function of a signal received
11 from said first base station; and

12 ii) a transmitter circuit for transmitting symbols
13 to said first base station, the transmitter circuit
14 including transmitter symbol timing control circuitry
15 slaved to said receiver symbol timing adjustment
16 circuitry, the transmitter symbol timing control
17 circuitry making adjustments to the transmitter symbol
18 timing which are the same or substantially the same as
19 the adjustments made by the receiver symbol timing
20 adjustment circuitry to the receiver symbol timing.

1 Claim 24 (original): The system of claim 23, further comprising:

2 a second base station for transmitting symbols to the
3 first and second mobile communications devices;

4 wherein the receiver symbol timing adjustment circuitry
5 of the first mobile communication device includes means for
6 independently determining symbol timing adjustments to be made when
7 processing symbols corresponding to each of the first and second
8 base stations; and

9 wherein the transmitter symbol timing control circuitry
10 of the first mobile communication device includes means for
11 independently adjusting the symbol timing of symbols transmitted to
12 the first and second base stations, respectively, as a function of
13 the symbol timing adjustments determined to be made when processing
14 symbols corresponding to the first and second base stations,
15 respectively.

1 Claim 25 (original): The system of claim 23, wherein the
2 transmitter included in said first base station is an OFDM
3 transmitter.

1 Claim 26 (original): A method of making symbol timing adjustments
2 in a communications device including a transmitter which transmits
3 multiple symbols in each of a plurality of dwells, the method
4 comprising the step of:

5 determining the number of samples by which the symbol timing
6 is to be advanced or delayed during a dwell;

7 increasing the number of samples in one of a first symbol and
8 a last symbol of said dwell by the determined number of samples
9 when said symbol timing is to be delayed during said dwell by the
10 determined number of samples; and

11 decreasing the number of samples in one of the first symbol
12 and the last symbol of said dwell by the determined number of
13 samples when said symbol timing is to be advanced during said dwell
14 by the determined number of samples.

1 Claim 27 (original): The method of claim 26, wherein the number of
2 samples in the remaining symbols in the dwell which includes said
3 one of the first symbol and the last symbol of said dwell to which
4 samples were added or removed to adjust symbol timing do not have
5 their number of symbols changed as part of making symbol timing
6 adjustments.

1 Claim 28 (original): The method of claim 26,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said first symbol, the first symbol including a
4 cyclic prefix portion and a body portion; and
5 wherein increasing the number of samples in said first symbol
6 includes:

7 copying samples from the body portion of said first
8 symbol and inserting the copied samples at the start of
9 said first symbol thereby increasing the number of
10 samples in said first symbol.

1 Claim 29 (original): The method of claim 26,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said first symbol, the first symbol including a
4 cyclic prefix portion and a body portion; and
5 wherein decreasing the number of samples in said first symbol
6 includes:

7 removing samples from the start of the cyclic prefix
8 portion thereby decreasing the number of samples in said
9 first symbol.

1 Claim 30 (currently amended): The method of claim 26,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said last symbol, the last symbol including a cyclic
4 prefix portion and a body portion; and
5 wherein increasing the number of samples in said last symbol
6 includes:

7 copying samples from the body portion of said first last
8 symbol and inserting the copied samples at the end of
9 said first last symbol thereby increasing the number of
10 samples in said first last symbol.

1 Claim 31 (currently amended): The method of claim 26,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said last symbol; and
4 wherein decreasing the number of samples in said ~~first~~ last
5 symbol includes:

6 removing samples from the end of said
7 last symbol thereby decreasing the number of samples in
8 said last symbol

1 Claim 32 (original): A communications device, comprising:
2 a transmitter which transmits multiple symbols in each of a
3 plurality of dwells, the transmitter including:
4 means for determining the number of samples by which
5 the symbol timing is to be advanced or delayed during a
6 dwell;
7 means for increasing the number of samples in one of
8 a first symbol and a last symbol of said dwell by the
9 determined number of samples when said symbol timing is
10 to be delayed during said dwell by the determined number
11 of samples; and
12 means for decreasing the number of samples in one of
13 the first symbol and the last symbol of said dwell by the
14 determined number of samples when said symbol timing is
15 to be advanced during said dwell by the determined number
16 of samples.

1 Claim 33 (original): The device claim 32,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said first symbol, the first symbol including a
4 cyclic prefix portion and a body portion; and
5 wherein said means for increasing the number of samples in
6 said first symbol includes:

7 means for copying samples from the body portion of
8 said first symbol and inserting the copied samples at the
9 start of said first symbol to thereby increase the number
10 of samples in said first symbol.

1 Claim 34 (original): The device of claim 32,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said first symbol, the first symbol including a
4 cyclic prefix portion and a body portion; and
5 wherein said means for decreasing the number of samples in
6 said first symbol includes:

7 means for removing samples from the start of the
8 cyclic prefix portion to thereby decrease the number of
9 samples in said first symbol.

1 Claim 35 (currently amended): The device of claim 32,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said last symbol, the last symbol including a cyclic
4 prefix portion and a body portion; and
5 wherein said means increasing the number of samples in said
6 last symbol includes:

7 means for copying samples from the body portion of said
8 first last symbol and inserting the copied samples at the
9 end of said first last symbol thereby increasing the
10 number of samples in said first last symbol.

1 Claim 36 (currently amended): The device of claim 35,
2 wherein said one of a first symbol and a last symbol of
3 said dwell is said last symbol; and
4 wherein said means for decreasing the number of samples in
5 said first last symbol includes:

6 means for removing samples from the
7 end of said last symbol thereby decreasing the number of
8 samples in said last symbol.

1 Claim 37 (previously added): A method for adjusting symbol timing
2 in a first communications device in a Orthogonal Frequency Division
3 Multiplexing system, the method comprising:

4 determining a receiver symbol timing adjustment to be made to
5 adjust receiver symbol timing in said first communications device
6 to synchronize receiver symbol timing to the symbol timing of a
7 second communications device; and

8 adjusting the symbol timing of a transmitter in said first
9 communications device as a function of said determined receiver
10 symbol timing adjustment,

11 said step of adjusting the symbol timing of the transmitter
12 including selecting one of a first and a last symbol in a dwell to
13 be modified to adjust the transmitter symbol timing, said dwell
14 being a period of time comprising multiple symbol tones prior to
15 switching to another tone or set of tones.

1 Claim 38 (previously added): The method of claim 37, wherein said
2 receiver symbol timing adjustment indicates that symbol timing
3 should be adjusted by an amount corresponding to D digital signal
4 samples.

1 Claim 39 (previously added): The method of claim 38, wherein said
2 step of determining a receiver symbol timing adjustment includes:
3 receiving a symbol timing correction signal transmitted from said
4 second communications device.

1 Claim 40 (previously added): The method of claim 38, wherein the
2 first communication device is a wireless terminal (104, 106).

1 Claim 41 (previously added): The method of claim 40, wherein the
2 second communication devise is a base station (102).

1 Claim 42 (previously added): The method of claim 41, further
2 comprising:

3 determining an additional receiver symbol timing adjustment to
4 be made to adjust receiver symbol timing of an additional receiver
5 in said first communications device to synchronize the additional
6 receiver symbol timing to be the symbol timing of a third
7 communications device, said third communications device being an
8 additional base station; and

9 adjusting the symbol timing of an additional transmitter in
10 said first communications device as a function of said determined
11 additional receiver symbol timing adjustment.

1 Claim 43 (previously added): The method of claim 40, further
2 comprising:

3 adjusting the symbol timing of a receiver included in said
4 first communications device to delay said receiver symbol timing by
5 said D samples; and

6 wherein the step of adjusting the symbol timing of said
7 transmitter in said first communications device includes delaying
8 the transmission of symbols by D samples by modifying the selected
9 symbol by adding D samples to said selected symbol thereby
10 increasing the duration of the selected symbol.

1 Claim 44 (previously added): The method of claim 43, wherein
2 symbols in said dwell other than said selected symbols are not
3 changed as part of adjusting the symbol timing of said transmitter.

1 Claim 45 (previously added): The method of claim 43, wherein the
2 first symbol in said dwell is selected as said selected symbol, the

3 selected symbol having N samples, the step of modifying the
4 selected symbol by adding D samples including:
5 copying D samples from a body of said first symbol and
6 inserting the D copied samples at the start of said selected symbol
7 to produce a modified first symbol having N+D samples.

1 Claim 46 (previously added): The method of claim 43, wherein the
2 last symbol in said dwell is selected as said selected symbol, the
3 selected symbol having N samples, the step of adjusting the symbol
4 timing further including:

5 copying D samples from a body of said selected symbol and
6 inserting the D copied samples at the end of said selected symbol
7 to produce a modified last symbol having N+D.

1 Claim 47 (previously added): The method of claim 40, wherein the
2 step of adjusting the symbol timing of said transmitter in said
3 wireless terminal includes:

4 adjusting the symbol timing of said transmitter included in
5 said first communications device to advance the transmission of
6 symbols.

1 Claim 48 (previously added): The method of claim 47, wherein
2 advancing the transmission of symbols includes the step of removing
3 D samples from said selected symbol thereby decreasing the duration
4 of said selected symbol.

1 Claim 49 (previously added): The method of claim 48, wherein said
2 selected symbol is the first symbol in said dwell, the selected
3 symbol includes N samples beginning with a K sample cyclic prefix;
4 and

5 wherein adjusting the symbol timing of said transmitter
6 includes modifying said selected symbol by deleting D samples from
7 the start of the K sample cyclic prefix of said selected symbol to

8 produce a first modified symbol having N-D samples, where N, D and
9 K are positive non-zero integers.

1 Claim 50 (previously added): The method of claim 48, wherein said
2 selected symbol is the last symbol in said dwell, the selected
3 last symbol having N samples; and

4 wherein adjusting the symbol timing of said transmitter
5 includes modifying said selected symbol by deleting D samples from
6 the end of said selected symbol to produce a modified last symbol
7 having N-D samples, where N and D are positive non-zero integers.

1 Claim 51 (previously added): A mobile communications device for an
2 Orthogonal Frequency Division Multiplexing system, comprising:
3 a clock;

4 receiver symbol timing control circuitry (208) coupled to said
5 clock (210) for determining a receiver symbol timing adjustment
6 used to synchronize receiver symbol timing to the symbol timing of
7 at least one broadcast signal;

8 transmitter symbol timing control circuitry coupled to said
9 clock and to said receiver symbol timing control circuitry, the
10 transmitter symbol timing control circuitry receiving symbol timing
11 adjustment information from said receiver symbol timing adjustment
12 circuitry

13 said transmitter symbol timing adjustment making a transmitter
14 symbol timing adjustment in a direction which is the same as a
15 receiver symbol timing adjustment made by said receiver symbol
16 timing control circuitry;

17 said transmitter timing control circuitry including means for
18 selecting a symbol to be lengthened or shortened prior to
19 transmission to implement said symbol timing adjustment, said
20 selected symbol being one of a first symbol and a last symbol in a
21 dwell, said dwell being a period of time during which a transmitter
22 of said mobile communications device remains on the same tone or

23 being a period of time comprising multiple symbol tones prior to
24 switching to another tone or set of tones.

1 Claim 52 (previously added): The mobile communications device of
2 claim 51, wherein the symbol timing control circuitry further
3 includes:

4 copy circuitry for performing a cyclic copy to be added
5 samples to said selected symbol to be transmitted when said
6 transmitter symbol timing is to be delayed; and
7 deleting circuitry for deleting samples from said selected
8 symbol to be transmitted when said transmitter symbol timing is to
9 be advanced.

1 Claim 53 (previously added): The mobile communications device of
2 claim 52, wherein said symbols are frequency division multiplexed
3 symbols, the mobile communication device further comprising:
4 an antenna for transmitting symbols including a symbol whose
5 duration has been changed by one of said copy circuitry and said
6 deleting circuitry.

Claim 54 (previously added): The mobile communications
device of claim 51,

wherein said receiver symbol timing control circuitry
(208) includes means for independently determining symbol
timing adjustments to be made when processing symbols
corresponding to each of a first and a second base station;
and

wherein said transmitter symbol timing control circuitry
(212) includes means for independently adjusting the symbol
timing of symbols transmitted to the first and second base
station, respectively, as a function of the symbol timing
adjustments determined to be made when processing symbols
corresponding to the first and second base stations,
respectively.